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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Ki-Hyun Kim

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EXAMINER

ABRAHAM, ESAW T

ART UNIT

PAPER NUMBER

2112

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/580,935

Applicant(s)

KIM ET AL.

Examiner

ESAW T. ABRAHAM

Art Unit

2112

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 13 and 14 is/are pending in the application.
4a) Of the above claim(s) 8-12, 15 and 16 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7, 13 and 14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 05/30/08 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/808)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Preliminary Amendment

1. The preliminary amendment filed on 05/30/08 has been entered.

Election Restriction

2. Applicant's election with traverse of Group I (including claims 1-7, 13 and 14) in the reply filed on 10/17/08 is acknowledged. The traversal is on the ground(s) that "that it would not present a serious burden for the Examiner to examine Group II (claims 8-12, 15 and 16) together with the claims of Group I. This is not found persuasive because Group II include technical features of *"extracting valid code word bits which represents code word bits corresponding to is in a row of a parity check matrix in a code word vector," extracting bit lengths between the valid code word bits in the code word vector; and determining the size of the interleaving unit based on the bit lengths between the valid code word bits"* would require an additional search in class 714/762 (and additional 337 patents). The Applicant is invited to view the extensive search that was performed for Group I, which is now part of the record (714/752 comprising 935 patents was searched). The requirement is still deemed proper and is therefore made FINAL.

Claims 8-12, 15 and 16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim.

Oath Declaration

3. The oath/declaration filed on 03/-0/07 is acceptable.

Information Disclosure Statement

4. The Information Disclosure Statements filed on 07/19/06 and 05/30/06 have been considered.

Priority

5. Acknowledgment is made of applicant's claim for **foreign priority** under 35 U.S.C. 119(a)-(d) which papers have been placed of record in the file.

Drawings

6. The drawings are objected to because:

The drawing (figure 5) is objected to because:

The figure has not been labeled as **---Prior Arts---**

A proposed drawing correction or corrected drawings are required in reply to the office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Corrected drawings sheets in compliance with 37 CFR 1.121(d) are required in reply to the office action should include all the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended". If a drawing figure is to be cancelled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheet may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header so as not to obstruct any portion of the drawing

figures. If the changes are not acceptable by the examiner, the applicant will be notified and informed of any required corrective action in the next office action. The objection to the drawings will not be held in abeyance.

Appropriate correction is required.

USC 112, 1st Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1 and 26 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.

In the specification which is critical or essential to the practice of the invention, but not included in the claim(s), for example, in paragraph [0019], the applicant's disclosure describes "an interleaver 120 receives the plurality of code word vectors 121 and generates an interleaved bit stream 131 by building an error correction block, by dividing the error correction block into a predetermined size of interleaving units, and by dispersing the interleaving units on suitable locations" is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Note: the error correction block is the one divided or partitioned into interleaving units not the codeword vector.

Claim Rejections - 35 USC § 112, 2nd

The following is a quotation of the second paragraph of 35 U.S.C. 112:

8. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "dividing the generated codeword vector into interleaving units, each interleaving unit having a size that is based on bit length between 1s included in a row of the parity check matrix"

It is unclear how the bit length between 1s included in a row of the parity check matrix affect the interleaving units of the codeword. For example, the generated codeword could be divided only if the bit length between 1s included in a row of the parity check matrix satisfy certain conditions, or the codeword could be divided based on other means in some way.

Claim 1 recites the limitation "the differently sized" in line 10. There is insufficient antecedent basis for this limitation in the claim.

Claim 2 recites the limitation "including only one 1 among all 1s" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 1-7 depend from claim 1 and inherently include limitations therein and therefore are rejected as well.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 1-7, 13 and 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non- statutory subject matter.

NON-STATUTORY SUBJECT MATTER

There can be no dispute that Applicants' claim would meet this definition of "process." But the Supreme Court has held that the meaning of "process" as used in § 101 is narrower than its ordinary meaning. See *Flook*, 437 U.S. at 588-89 ("The holding [in *Benson*] forecloses a purely literal reading of § 101."). Specifically, the Court has held that a claim is not a patent-eligible "process" if it claims "laws of nature, natural phenomena, [or] abstract ideas." *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (citing *Flook*, 437 U.S. at 589, and *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Such fundamental principles⁵ are "part of the storehouse of knowledge of all men . . . free to all men and reserved exclusively to none." *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948); see also *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."). "Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Benson*, 409 U.S. at 67; see also *Comiskey*, 499 F.3d at 1378-79 (holding that "mental processes," "processes of human thinking," and "systems that depend for their operation on human intelligence alone" are not patent-eligible subject matter under *Benson*).

A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.

See *Benson*, 409 U.S. at 70 ("Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."); *Diehr*, 450 U.S. at 192 (holding that use of mathematical formula in process

"transforming or reducing an article to a different state or thing" constitutes patent-eligible subject matter); see also *Flook*, 437 U.S. at 589 n.9 ("An argument can be made [that the Supreme] Court has only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a 'different state or thing'"); *Cochrane v. Deener*, 94 U.S. 780, 788 (1876) ("A process is . . . an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.").

The claim at issue in *Flook*, in contrast, was directed to using a particular mathematical formula to calculate an "alarm limit"—a value that would indicate an abnormal condition during an unspecified chemical reaction. 437 U.S. at 586. The Court rejected the claim as drawn to the formula itself because the claim did not include any limitations specifying "how to select the appropriate margin of safety, the weighting factor, or any of the other variables . . . the chemical processes at work, the [mechanism for] monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system." See *id.* at 586, 595. The claim thus was not limited to any particular chemical (or other) transformation; nor was it tied to any specific machine or apparatus for any of its process steps, such as the selection or monitoring of variables or the setting off or adjusting of the alarm.

A canvas of earlier Supreme Court cases reveals that the results of those decisions were also consistent with the machine-or-transformation test later articulated in *Benson* and reaffirmed in *Diehr*. See *Tilghman*, 102 U.S. at 729 (particular process of transforming fats into constituent compounds held patentable); *Cochrane*, 94 U.S. at 785-88 (process transforming grain meal into purified flour held patentable); *Morse*, 56 U.S. (15 How.) at 113 (process of using electromagnetism to print characters at a distance that was not transformative or tied to any

particular apparatus held unpatentable). Interestingly, Benson presents a difficult case under its own test in that the claimed process operated on a machine, a digital computer, but was still held to be ineligible subject matter. However, in Benson, the limitations tying the process to a computer were not actually limiting because the fundamental principle at issue, a particular algorithm, had no utility other than operating on a digital computer. Benson, 409 U.S. at 71-72. Thus, the claim's tie to a digital computer did not reduce the pre-emptive footprint of the claim since all uses of the algorithm were still covered by the claim.

The Supreme Court has held that mental processes, like fundamental principles, are excluded by § 101 because "[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts . . . are the basic tools of scientific and technological work." Comiskey, 499 F.3d at 1377 (quoting Benson, 409 U.S. at 67) (emphasis added). And we actually applied the machine-or-transformation test to determine whether various claims at issue were drawn to patent-eligible subject matter.²⁴ Id. at 1379 ("Comiskey has conceded that these claims do not require a machine, and these claims evidently do not describe a process of manufacture or a process for the alteration of a composition of matter."). Because those claims failed the machine-or-transformation test, we held that they were drawn solely to a fundamental principle, the mental process of arbitrating a dispute, and were thus not patent-eligible under § 101. Id.

The machine-or-transformation test is a two-branched inquiry; an applicant may show that a process claim satisfies § 101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article. See Benson, 409 U.S. at 70. Certain considerations are applicable to analysis under either branch. First, as illustrated by Benson and

discussed below, the use of a specific machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility. See *Benson*, 409 U.S. at 71-72. Second, the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity. See *Flook*, 437 U.S. at 590.

Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances.

The basis for this language in *State Street* and *Alappat* was that the Supreme Court has explained that "certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application." *Alappat*, 33 F.3d at 1543; see also *State St.*, 149 F.3d at 1373.

Further, by identifying the apparatus that accomplishes the method steps, A recitation of a computer in the **preamble** does not appear to be sufficient to tie the process to a particular apparatus. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone (See *In re Hira*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951)).

Furthermore, the claims 1 and 26, do not transform an article or physical object to a different state or thing (note: transformation of data is not "physical transformation") and does not produce a "useful, concrete and tangible result". The final result in the claims "generating

and dividing codeword vectors and interleaving the codeword vectors using the differently sized interleaving unit" which is not tangible as these steps are not being communicated or conveyed (such as in displaying for example) to someone or something to provide a "real world" result.

Therefore, the "process" of instant **claims 1 and 26** do not require any transformation and reduction of an article "to a different state or thing." Nor is the "process" tied to a particular machine that transforms data in such a way to produce a useful, concrete, and tangible result. Under a broad but reasonable interpretation of claims 1 and 26, the subject matter of the claim requires at most human thought and paperwork.

Claims 2-7 and 14 are at least rejected for their dependencies, directly or indirectly, on the rejected claims 1 and 13 above.

Conclusion

10. Upon receiving a response from the applicant, including claim amendments, the Examiner reserves the right to perform another search and reject the claims or prior art if applicable. Relevant art has been cited herein, however not applicable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Esaw T. Abraham whose telephone number is (571) 272-3812. The examiner can normally be reached on M-F 8am-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EA/

/Esaw T Abraham/
Primary Examiner, Art Unit 2112